

tioned there is a sort of tooth on the basal margin of the peristome, whilst in *H. ignicomma* the basal margin is only slightly sinuate.

Note.—The shell identified by me with *Bulimus immaculatus*, Reeve, seems probably not to be that species, but an uncoloured variety of the Trinidad form of *B. multifasciatus*, determined to be *B. vincentinus*, Pf.

The *Planorbis* regarded as identical with a Cuban species should be *P. terverianus*, not *terversanus*.

Port of Spain, Trinidad, April 1868.

L.—*Carcinological Gleanings.* No. III.

By C. SPENCE BATE, Esq., F.R.S.

[Plate XXI.]

Dr. Cunningham writes me from

At sea, November 8, 1867.

(Between Monte Video and Magellan Strait.)

MY DEAR SIR,

I have long had it in my mind to write to you, as you were so good as to express a wish to hear from me occasionally during my absence from the United Kingdom, when I had the pleasure of meeting you at Plymouth last year; and I now put my intention into execution. We left Plymouth on the 8th of September, 1866, but encountered such a severe gale that after battling with it and vainly attempting to run into Brest, we were forced to return to the Sound on the 10th, and lay there till the evening of the 17th, when we again set forth, and, after a rather rough passage, reached Madeira, where we remained for about a week. Unfortunately, we were placed in quarantine for the first five days of our stay, so that I was not able to see nearly as much of the island as I wished. So much has been said of the wonderful beauty of Madeira that I will not enlarge upon it, but content myself with observing that I think it is about the most lovely place I have seen since I left home. I accomplished a little dredging in the Bay of Funchal, and obtained a variety of Mollusca, chiefly belonging to European types. A *Dentalium* was specially abundant in the fine mud of the bottom, existing in hundreds. I, however, met with no Crustacea. I had a delightful ride up the Grand Canal on the 2nd of October; and on the evening of the same day we left Madeira for St. Vincent, in the Cape Verde group. There we arrived on the forenoon of the 9th, and remained four or five days, in the course of which I had some pleasant rambles. I need hardly say that St. Vincent is noted for its extreme

sterility; but, owing to the prevalence of heavy rains, which had shortly before taken place, it was much greener than usual at the time of our visit; and I was surprised by the variety of plants I met with. I devoted one afternoon to marine researches, and I met with a considerable number of Mollusca and a few Crustacea (principally crabs). I also got a species of *Hippa* or *Remipes*, which burrows in the sand, and is, I was informed, employed as bait for fish. We took our departure early in the evening of the 13th for Rio. In the course of the voyage I employed the towing-net whenever practicable, and with tolerable success, obtaining specimens of *Ianthina*, various Pteropods, *Porpita*, *Verella*, &c. I saw some beautiful *Physalia*, but did not capture any. On the 16th I got a large suctorial crustacean off the gills of a flyingfish which flew on board; and I was nearly forgetting to mention that on the 14th I got a specimen of *Alima hyalina* [Appendix, I.] in the towing-net. We entered the magnificent harbour of Rio de Janeiro late on the evening of the 2nd of November, and we stayed till the afternoon of the 18th. On the stones in shallow water in the harbour an Isopod allied to our British *Ligia* [App., II.] was abundant. We encountered two gales between Rio and Monte Video, where we arrived on the 23rd. During our stay of nearly a fortnight I saw as much as I could of the neighbourhood. The country is very monotonous, consisting for the most part of gently undulating pampas covered with tall thistles. Some parts of these plains, however, are rendered beautiful by the beds of purple and scarlet *Verbenas*. The marine life except the fish, which are numerous, is barrenness itself. One day when I took a long walk along the beach outside the town, and diligently searched for marine animals in the rock-pools, the only living thing that I could find was a small dusky-coloured shore-crab, which existed in numbers. I forgot to say that between Rio and Monte Video I one day procured three specimens of an *Idotea* [App., III.; Plate XXI. fig. 1], or some closely allied form, in the towing-net, 200 miles off land. They were at first of a brilliant blue tint, but have faded in the spirit in which they were put. We left Monte Video on the 6th December, and, after spending a day at Maldonado, shaped our course for the Strait, which we entered on the 21st. On the afternoon of the 22nd we anchored off the Chilian settlement of Puntas Menas, better known to us as Sandy Point; and shortly after, I landed for the first time in Patagonia. It is a truly delightful sensation to land for the first time in a new and wild country, and I greatly enjoyed my walk that day. Pursuing my way along the beach, the first Crustacean I met with was *Serolis Fabricii*,

with whose curious form I had long been familiar from figures. This animal occurs plentifully about Sandy Point, and was taken in hundreds in our seine. When on the ground, it crawls along very sluggishly; but I have seen it paddling rapidly on its back along the surface of shallow pools. The same day I found numerous fragments of a large spiny *Lithodes*, very closely resembling our *L. arcticus*, about which we had some correspondence a year or two ago. This and another species of the same genus, which is not nearly so spiny, the spines being replaced in great part by tubercles, appear to be two of the most abundant Crustacea in the eastern part of the Strait. In both, as in all the other foreign species of *Lithodes* which I have had an opportunity of examining, the pleon is formed on the same plan as that of our British one; *i. e.* in the male the plates are symmetrical, while in the female they are prominently asymmetrical. I got a small male specimen of what I think may be a third species, at Port Famine, one day we spent there. I procured several other Decapoda in the Strait, a small *Munida* [App., IV.] among the number, and a variety of sessile-eyed Crustacea, though not so many as I anticipated. I got one or two *Nymphons* and a species of *Hyperia* [App., V.]. We left the Strait about the middle of February for the Falkland Islands, to get fresh supplies of provision and coal, and reached Stanley Harbour in the course of three days. While we were there, the weather was very broken, so that I could not accomplish any long excursions; but, as far as I could judge, there appears to be a very great similarity between the fauna and flora of the Falklands and those of the Strait. We left Stanley on the 2nd of March, and on the following day, in the forenoon, we noticed several brilliant scarlet-coloured patches in the water floating past the ship. We investigated their nature by means of a bucket let down over the side, and found they were composed of multitudes of a small macrurous decapod which swam rapidly about by rapid flexions and extensions of the tail, the movement being backwards, as in our common lobster. I preserved several specimens of the animal, besides making a sketch of it [App., VI.; Pl. XXI. fig. 2], which I send to you. The entire length of the crustacean, when the tail, which was ordinarily curved underneath the body, was extended, was about three-fourths of an inch; and the limbs bearing the chelæ were nearly an inch long. The general colour was scarlet, the eyes, a large patch on the carapace, and a line extending along the abdominal segments bluish black. I have not been able to identify the animal from the descriptions I have with me. I ought, however, to state that I have a very small stock of books at hand. Captain Mayne

has pointed out to me that in the narrative of the voyage of the Nassau fleet, undertaken in 1623, as given in Binney's *Voyages*, vol. iii. p. 9), it is recorded that on the 19th and 20th of January, 1624, when the fleet was off the coast of South America in lat. $42^{\circ} 15' S.$, "the sea near them was in many parts discoloured with an infinite number of small red shrimps." On our return to the Strait, we continued our operations till the middle of June, when the increasing severity of the weather caused us to move northwards for winter-quarters. We reached Rio de Janeiro on the 1st of July, and remained there for three months and a half. I need not descant on the glorious scenery or the wonderful profusion of animal- and plant-life in that magnificent country; for that, I presume, is well known to you. I could not afford time for any very long journeys, but went far enough to see the virgin forests in all their glory. I paid two visits to the house of a most hospitable Scotchman who lives on the Serra do Mar, about fifty miles from Rio; and I spent a few days at Tijuca, about ten miles from the city, where I saw the most wonderful exhibition of boulders that it has ever been my lot to witness.

The mention of Tijuca reminds me of a matter that I shall feel much obliged to you if you can give me a little information upon, viz. how far is the development of the land and freshwater decapods made out? I am aware that the crayfish is stated not to undergo any metamorphosis in the young state; but I have not been able to ascertain, in the limited number of books which I have here for consultation, whether the same thing holds good in the Brachyurous Decapoda. I obtained several specimens of a crab, in the province of Rio de Janeiro, which frequents streams and damp rocks in their vicinity; and while exploring the banks of a cascade in the neighbourhood of Tijuca, I obtained a female specimen, which, to my surprise, had between fifty and sixty fully developed live young ones under the pleon, in the ordinary position of the ova. These little creatures were very active, and several escaped on the parent being captured; but I have preserved a number of them, and I send you specimens in this letter, together with a careful sketch of the parent. This occurrence, it appears to me, goes far to prove that this species either undergoes no marked metamorphosis between the egg and the perfect animal, or else that the metamorphosis takes place while the young animal is beneath the pleon of its parent. The body of the adult crab is of a dull purple colour; the legs are of a considerably paler tint. [App., VII.; Pl. XXI. fig. 3.]

I obtained several species of marine Crustacea while at Rio. In an excursion which I made along the beach outside the harbour, I saw many specimens of an *Ocypoda*, but only succeeded in capturing one, owing to the extreme rapidity of their movements; and on another occasion I obtained specimens of a *Lupea*, a *Hepatus*, and a *Hippa*, in Five-fathom Bay.

In the month of September the screw of the vessel was raised in order to clean it, and I found numbers of *Caprella* [App., VIII.] clustering amongst the tufts of zoophytes with which the metal was profusely covered. I send you specimens of this, as well as of a crustacean * which has occurred in plenty in the towing-net several times in the course of our voyage southwards to the Strait. We expect to enter the Strait in the course of a couple of days, and shall be there and in Smyth's Channel for six or seven months, after which we shall probably spend a few months at Valparaiso. If you have leisure to write me a few lines, it will be doing me a great favour; for I am very much cut off at present, as you may imagine, from scientific intelligence. My address will be "H. M. S. 'Nassau,' Valparaiso, via Panama."

With kind regards, believe me,

My dear Sir,

Very truly yours,

ROBERT O. CUNNINGHAM.

Appendix. By C. SPENCE BATE.

I. *Alima hyalina*.—From researches made by Dr. Power during his stay in the Mauritius, and which are now in my hands preparatory to publication, I have great reason to believe that the genus *Alima* is but the second stage in the development of the genus *Squilla* and its allied forms.

II. *Ligia*.—No species (that I am aware of) has been recorded from the eastern coast of South America. It may therefore be *L. Baudiana* of Milne-Edwards, from the Gulf of Mexico, which bears a very near general resemblance to the British species. The habitat, however, is very remarkable; for the European species is never found in water, but only within reach of the spray of the sea.

III. *Idotea annulata*, Dana (Pl. XXI. fig. 1).—The deep blue colour of which Dr. Cunningham speaks appears to be a peculiarity belonging to pelagic species. I have received specimens of this same from Dr. Wallich, who says that it "is a parasite on *Physalia*, almost invariably adherent to the

* *Idotea annulata*.

float." He took them between the Bay of Bengal and the Cape of Good Hope. The specimen from which Dana described the species was "taken in the Antarctic seas south of New Holland."

IV. *Munida*.—Probably same as VI.

V. *Hyperia*.—Having received several specimens of these from Dr. Cunningham, I have been enabled to identify them as being *Themisto antarctica* of Dana.

VI. (Plate XXI. fig. 2).—Judging by Dr. Cunningham's drawing, I think that these must be the young of *Galathea monodon* of Milne-Edwards, of which the *Munida (Galathea)* alluded to in No. IV. as being captured in the Strait was a stray specimen.

VII. *Uca Cunninghamsi* (Pl. XXI. fig. 3).—The development of the land-crabs, of which this is one, has been carefully worked out and figured, in the 'Transactions of the Royal Society,' by Prof. Westwood. I know this species only by Dr. Cunningham's figure, and place it in the genus *Uca* rather than in that of *Gecarcinus*, because there are no teeth or spines on the legs. The two genera, as well as those of *Cardisoma* and *Gecarcoidea*, are distinguished from each other by the different form of the gnathopoda, which, not being shown in Dr. Cunningham's drawing, I cannot appeal to. But since the species of the several genera described by M. Milne-Edwards are distinguished by having rows of spines or teeth on the walking-legs, I think it more probable that this species may be more closely allied, through the form of the oral apparatus, with *Uca* than with either of the others.

Female. Carapace circularly oval; lateral margins not converging until over the penultimate pereopod, then suddenly narrowing to about one-third of the broadest diameter of the carapace; anterior or intraorbital margin smooth and continuously emarginate; latero-frontal margins rounded, not defined, furnished with two short teeth formed rather by depressions than dental elevations. Orbits broad, and not deeply impressed in the carapace. Antennæ short. First pair of pereopoda chelate, unequal, right the larger; chelæ strong, having the internal margin of digital process of the propodos straight, tapering, and armed with four or five strong tubercles; dactylos curved, tapering, and armed with one or two small tubercles. The rest of the pereopoda are subequal in length, the last being somewhat the shortest, and have the tarsi smooth and unarmed. The pleon has none of the segments fused. The telson is narrower at the base than the preceding segment.

VIII. *Caprella*.—Among the numerous specimens sent to me by Dr. Cunningham, all appear to correspond with Dana's description of *C. dilatata*, except one, which more nearly coincides with *C. robusta*—a circumstance that confirms the opinion expressed in the British-Museum 'Catalogue of Amphipodous Crustacea,' that the two species are but sexually distinct. Dana's specimens, like those of Dr. Cunningham, were brought up with the anchor in Rio Harbour.

EXPLANATION OF PLATE XXI.

Fig. 1. *Idotea annulata*, Dana.

Fig. 2. *Galathea monodon*, Milne-Edwards (young), natural size: *c*, carapace slightly enlarged; *k*, first pair of pereopoda.

Fig. 3. *Uca Cunninghami*, n. sp., ♀, nat. size: *P*, pleon, seen on the outer side; *P'*, the same, inside, *in situ*, showing:—*p*, pleopoda; *v*, young crabs; *z*, termination of intestinal track; *t*, one of the pleopoda.

LI.—On Eugereon Boeckingi and the Genealogy of the Arthropoda. By Dr. ANTON DOHRN*.

THE *Eugereon* [described and figured by the author in Dunker's 'Palæontographica,' Bd. xiii.] was found in an iron-stone-pit belonging to M. Boecking, near the Abenteuerhütte, in the district of Birkenfeld. The stone containing it is an argillaceous sphærosiderite, which occurs between the carboniferous formation and the Lower New Red Sandstone, and which also contains a number of known Fishes and the celebrated *Archegosaurus*, together with ligneous fibres as the sole vegetable remains. I have lately received from the same pit an admirably preserved impression of the fore wing of a *Blatta*; so that it is to be hoped that the insect-fauna of former ages will be further enriched from this locality. As early as 1856, however, F. Goldenberg described some insects from the Coal-measures of Saarbrück; and still earlier, in 1842, Germar described several species of *Blattina* from the carboniferous rocks of Wettin. Still older discoveries have been made in North America: Samuel Scudder has described two new Neuropterous forms from the Coal-measures of Illinois, *Miamia* and *Hemeristia*, for both of which he requires the establishment of new families, Palæopterina and Hemeristina,—and also, from the still lower Devonian strata of New Brunswick, wings which he identifies as those of Ephemera, but one of them

* Translated by W. S. Dallas, F.L.S., from the 'Stettiner entomologische Zeitung,' Jahrg. xxviii. (1867) pp. 145–153.